manner, a new assay surface can be applied and removed after use. After removal, the laminate may either be cleaned and reused, or disposed of. This may be advantageous for several reasons, including, but not limited to, allowing the top surface of moving surface **1** to be easily and quickly customized for each assay performed. To remove any static charge build up on the moving surface during the lamination process, which may cause droplets dispensed from a syringe bank **2** to jump instead of being dispensing in a desired pattern, an antistatic gun or ionizer may be used. One such ionizer ionizes the air using alpha particles, for example. In preferred embodiments of the invention, the ionizer is placed in proximity to the belt, after the lamination and before the dispensing stations.

[**0045**] Laminate **6** can be customized for numerous surface properties (as can the moving surface **1** if no laminate is applied). These properties include, but are not limited to, cleanliness, biocompatibility, surface energy, binding affinity, separation, porosity, chemical addition and interaction, sample information encoding and tracking, and the addition of surface features.

[**0046**] Cleanliness and Biocompatability

[**0047**] Surface cleanliness and biocompatibility are critical for assay quality. Laminate **6** may include a biocompatible surface such as, but not limited to, Teflon, polypropylene, or polyethylene. Furthermore, the surface of laminate **6** can be such that it is easily washable after application. This is important if the active face of laminate **6** is contaminated as received or if it is to be recycled through the assay system.

[**0048**] Surface Energy

[**0049**] In accordance with various embodiments of the invention, the surface of laminate **6** is chosen to have a low surface energy to localize the aqueous sample drops and minimize spreading, or a high surface energy to maximize spreading and contact with the tape. 'Surface energy,' in this context, refers to wettability. Additionally, the surface of laminate **6** may have a uniform surface energy, or a pattern of surface energies such as hydrophilic spots on a hydrophobic background that serves to promote drop adhesion as well as minimize drop migration. This pattern can be pre-existing on the surface of the laminate **6**, or applied to the surface inline, such as by lamination or by localized corona discharge devices. Applying the pattern inline obviates the need for pre-registering the laminate **6** with the drop placement, as the surface energy pattern is applied in a pattern registered with the drop dispensing.

[**0050**] Binding

[**0051**] The surface of the laminate **6** may be prepared, either uniformly or spatially distributed, with a surface that binds, selectively or non-selectively, to molecules in the assay sample. In this manner, heterogeneous processes such as washing or Fluorescence In-Situ Hybridization (FISH) can be performed. For example, washing can be accomplished by passing the laminate **6** through a wash bath and removing the unbound components of the droplet. Sample coatings that can be used and that are known in the art include streptavidin and biotin.

[**0052**] Separation

[**0053**] In various embodiments of the invention, laminate **6** is magnetic, either by being magnetic material or by passing over a magnet, to allow the use of magnetic bioseparation beads or other devices. The beads can be added to the droplet to bind molecules of interest, which then attach to the laminate through magnetic interaction. The droplet can then be washed, in a bath or otherwise, with the beads and molecules of interest still fastened to their original location on laminate **6**. The use of a flexible magnetic strip may be advantageously used as a magnetic surface for laminate **6**. The strip is made up of tiny individual magnets dispersed in a polymeric binder. This provides magnetic flux gradients that capture the beads in place, whereas a uniformly magnetized surface would capture the beads but allow them to migrate on the surface across the uniform magnetic field. The flexible magnetic strip may be permanently magnetized, such as the "refrigerator magnet" type strip, or be temporarily magnetized, such as high quality metal particle recording media. The flexible magnetic strip also has the advantage that sample information can be written next to the sample droplet on the tape for later identification or to facilitate analysis.

[**0054**] Porosity

[**0055**] In another embodiment of the invention, either the entire surface, or part of laminate **6** is made porous. This increases the contact area of the droplet with the derivatized surface, so as to minimize the exposure the droplet has with the atmosphere, or for filtration. The pores can be through the depth of the tape, or only a fraction thereof. The pores can be isotropic or anisotropic. In one embodiment of the invention, the pores of laminate **6** are oriented perpendicular to the surface and travel only a fraction of the film thickness. The allows sample penetration beneath the surface while minimizing sample spreading.

[**0056**] Chemical Addition

[**0057**] In accordance with one embodiment of the invention, the surface of the laminate **6** can be prepared uniformly or in a spatially patterned manner with one or more chemicals designed to participate either chemically or physically in the assay.

[**0058**] For example, laminate **6** can be coated with a surfactant such that upon addition of the sample, the surfactant diffuses to the surface of the sample drop to help retard evaporation. Suitable materials for this example include, but are not limited to, fatty acids and fatty alcohols such as dodecanol.

[**0059**] Other examples include, but are not limited to, coating laminate **6** with a MALDI matrix to enable the ionization of the sample components or their reaction products, or coating laminate **6** with Ion-exchange resin or with affinity-labeled sepharose beads.

[**0060**] Surface Features

[**0061**] The surface of the laminate **6** may incorporate surface features such as cups or indentations, tube holders, holes, and funnels. Another laminate **6** may also be applied to the surface, in particular, a surface with cups, to act as a lid to prevent sample contamination and provide environmental control.

[**0062**] An efficient high throughput screening system **8** requires physical operations to be performed both in a serial (time sequential) and parallel manner. As is known in the art, a two-dimensional array of through holes can be rapidly